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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

REPORT NO.

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COUNTRY USSR

DATE DISTR. 13 Dec. 1950

SUBJECT The Central Scientific Research Institute of Technology and Machine Construction (TsNIITMash)

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LIBRARYThe TsNIITMash

1. [REDACTED] The Central Designing and Planning Bureau of Metallurgical Machine Construction which was part of the Central Scientific Research Institute of Technology and Machine Construction (TsNIITMash) in Moscow, directed by Professor Odinch. [REDACTED] the primary idea of the TsNIITMash is to service the Ministry of Heavy Machine Construction and its plants by determining the practical problems confronting the Ministry and by solving them scientifically both in theory and in practice. For many reasons, however, the TsNIITMash is not in a position to do this, although it does work on several scores of problems simultaneously.

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Assignment of Problems

2. Although some problems are assigned to the TsNIITMash by the Ministry of Heavy Machine Construction and some possibly originate with the Academy of Sciences of the USSR, most of the problems originate within the TsNIITMash itself. For example, most of the themes for scientific research for the Designing and Construction Bureau originated with Professor A.I. Tselikov, who was head of this Bureau [REDACTED]

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Sometimes practical problems, such as testing of metal, lumber, or glue, which have arisen in customer plants are brought to the attention of the TsNIITMash and the latter works on them in its own shops and laboratories. The TsNIITMash is financed by the Ministry of Heavy Machine Construction, which has special funds for this purpose, but work performed for outside agencies is paid for by these agencies.

Planning

3. In the case of the TsNIITMash, [REDACTED] the majority of problems for research and perhaps deadlines for completing work on such problems are submitted by the Institute to the Technical Department of the Ministry of Heavy Machine Construction for approval. It is possible that such plans are approved by the Minister, but he evidently follows the recommendations of the Technical Department. [REDACTED]

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there is no separate planning institute of the Ministry of Heavy Machine Construction which submits plans to the Academy of Sciences for approval. [REDACTED] the Academy of Sciences of the USSR controls and directs the work of scientific research institutes but [REDACTED] the Soviet principle of planning from above is necessarily modified because suggestions for planning the work originate with the individual institutes. After a draft plan has been approved at the high level, details may be changed if necessary for the practical carrying out of the plan, but the basic idea must remain the same.

Engineering Development

4. After designing equipment, the TsNIITMash usually carries out the engineering development of this equipment as far as the technical drawings. These drawings do not always include detailed specifications, however. The working drawings are left to the designing bureau of the plant which is to produce the particular item of equipment or machinery. It is possible that occasionally both technical and working drawings are prepared by the designing offices of individual plants. On the other hand, in some cases the TsNIITMash has gone as far as actually producing equipment. For example, for a number of years the Bureau of Gas Turbines of the TsNIITMash worked on the design and construction of gas turbines with the ultimate objective of producing a finished gas turbine rather than just its drawings.

Other Research Institutes

5. [REDACTED] other research institutes besides the TsNIITMash. [REDACTED] cannot identify by name, but which is considered a large research institute specializing in research on autogenous cutting and welding. It was a large four-storied building in the suburbs of Moscow. Admittance to the building was granted only upon presentation of a special pass. Many workers were employed there. [REDACTED]

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SUBJECT 1. Equipment and Capacity of Soviet Steel Mills
2. Elektrostal Steel Works

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I Equipment and Capacity of Soviet Steel Mills, 1941

1. The varying periods of construction and the use of equipment from several foreign countries has resulted in a lack of uniformity in Soviet rolling mills. Even mills with the same finished products may differ from each other in technical equipment. For this reason it is difficult to speak of "typical" Soviet mills.

Equipment

2. The majority of the rolling mills in the USSR are of the latest type, built according to specifications provided by United States firms; the predominating type follows the pattern of the U.S. Steel Corp. The only continuous rolling mill in the USSR was built according to specifications from this firm and was installed in the mid-nineteen thirties at the metallurgical plant in Zaporozhe. Roughing and intermediate stands and finishing mills are also built according to specifications supplied by the U.S. Steel Corp. These are replacing old equipment formerly supplied to the USSR by Western European countries, especially Germany. There is no standard type, composition, and harness of rolls used for different hot rolling operations in blooming mills in the Soviet Union. Some of those built in 1880 are still in use.
3. Very few plants are still using hand operated mills; all new mills are mechanically operated and replacement parts are readily available in case of breakdown. As soon as a mill develops a poor surface, the roll is removed for grinding. The average roll grinding equipment is old fashioned.
4. All blooming and slab mills in the USSR are of the 2-high reversing type. [REDACTED] a new slab mill with two motors which was under construction for the Novo Tagil Steel Combine in the Urals. The type of billet mill generally used is the 2-high reversing type with electric motor, groove, a central distance of gears of 850-900 mm, and a roller 2,000 - 2,300 mm long.

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5. Hot rolling of both carbon steel and alloyed steel is made on the same type rolling mills, which have U.S. pattern groovings. Alloy steel strips and sheet are hot rolled on strip and sheet rolling mills respectively. Cold rolling of carbon steel and alloy strips and sheet is done on 2-high roll stands with four, six, and sometimes eight rollers. The rollers are used in accordance with the type of production required. In plants in the Soviet Union the sheets are flattened by plating, rolling, and leveling.

6. [REDACTED] does not know whether there are any Soviet strip mills equipped with flying shears, but [REDACTED] such equipment is possible only in recently constructed or reconstructed mills. [REDACTED] in 1940 a designing and planning engineer of the NKMZ in Kramatorsk named I.P. Zaetz was engaged in designing flying shears to be built by the NKMZ for a continuous strip mill. [REDACTED] the speed of the strip at the moment of cutting was 20 meters per second.

Capacity

7. Several large blooming mills in the USSR have a central distance of gears of 1,160 mm. [REDACTED] the capacity of these blooming mills is 1,200,000 to 1,300,000 tons of blooms per year. There are five or seven post-war blooming mills with a central distance of gears of 1,000 mm. The yearly capacity of these blooming mills is estimated to be 600,000 to 800,000 tons of blooms and slabs per mill. [REDACTED] with proper planning and operation, the capacities of both small and large blooming mills could be greatly increased.
8. The rail mill of the Azovstal metallurgical plant, which was designed by the NKMZ in Kramatorsk just before World War II, had a rated capacity of 800,000 to 1,000,000 tons of rolled steel per year. The rail mill of the Novo Tagil metallurgical works (steel combine?), which was completed by the NKMZ in Elektrostal after the war and put into operation in 1946 or 1947, had a rated capacity of 600,000 to 800,000 tons of rolled steel per year.*

II Elektrostal Steel Works, June 1942 - June 1945

9. [REDACTED] a considerable part of the production of the Elektrostal Steel Plant was in the form of specially alloyed steel. [REDACTED] this plant used to smelt very expensive kinds of alloyed steel, some of which cost up to 100,000 rubles per ton, while regular carbon steel used in machine construction cost 1,000 to 2,000 rubles per ton.
10. [REDACTED] rumor that this plant has a very strong metallurgical department employing highly qualified metallurgical specialists. Furthermore, [REDACTED] that experiments were carried out with the idea of producing new kinds of steel. In addition to specialists in metallurgy, the Elektrostal Steel Plant had a group of specialists in steel rolling, [REDACTED]
11. [REDACTED] not sure about the location of the research department of the Elektrostal Steel Plant, but [REDACTED] the impression that it is in a small building on the premises of the plant on the side toward the city of Elektrostal.

* Comment: [REDACTED] just before World War II, the Ministry of Ferrous Metallurgy of the USSR published a book called Rolling Mills of the USSR, which contained much technical data on the pre-war rolling industry of the USSR. Unfortunately very few copies of this were made available before the book was withdrawn from circulation.

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